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ABSTRACT

This is the third in a series of three tests of selected micro-teaching and video recording feedback techniques in laboratory settings designed to stimulate vocational teacher education programs. A comparison was made of the relative effectiveness of: (1) face-to-face supervision with video feedback, (2) remote supervision via video feedback which included a second sound track with the teacher educator's comments, and (3) remote supervision via video feedback augmented by instructional models for self-comparison. Three feedback groups, each consisting of four vocational teachers, practiced demonstrating a manipulative skill during seven 5-minute teaching sessions. Their lessons were evaluated by a panel of two judges using a critique form on demonstrating a manipulative skill. An analysis of the mean performance scores revealed no significant differences in effectiveness among the techniques, but it did reveal a significant change in the teachers' performance. It was concluded that the three feedback techniques were feasible methods for programs of vocational teacher education. (Author/GEB)

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Research and Development Series No. 55

Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education: Phase III--

An Analysis of Instructional Model and Remote Feedback Techniques

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The Center for Vocational and Technical Education
The Ohio State University, 1900 Kenny Road, Columbus, Ohio 43210

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RESEARCH AND DEVELOPMENT SERIES NO. 55

ASSESSMENT OF MICRO-TEACHING AND VIDEO RECORDING IN VOCATIONAL AND TECHNICAL TEACHER EDUCATION: PHASE III--

AN ANALYSIS OF INSTRUCTIONAL MODEL AND REMOTE FEEDBACK TECHNIQUES

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U.S. DEPARTMENT OF
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National Center for
Educational Research
and Development

PREFACE

This is the third in a series of three tests of selected micro-teaching and video recording techniques designed to facilitate the identification of alternate ways to increase the efficacy of vocational teacher education. The tests were conducted to develop feedback techniques in a laboratory under simulated teacher education conditions. This developmental effort further served as a screening device for the most promising techniques prior to seven demonstration and field testing activities which were part of the project, "Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education." While this was a small-scale feasibility test, we believe vocational and technical teacher educators and researchers will find the results both interesting and beneficial.

We wish to acknowledge the following Center project personnel: Dr. Calvin J. Cotrell, Principal Investigator; Dr. Charles R. Doty, Associate Investigator; James L. Hoerner, Edward R. Hauck, and Niyazi Karasar, Graduate Research Associates.

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Robert E. Taylor
Director
The Center for Vocational
and Technical Education

FOREWORD

This report is the third in a series conducted from September, 1967 to October, 1969 at The Center for Vocational and Technical Education. The series of three studies were essential feasibility tests before the planning and implementation of seven demonstration and field tests conducted in collaboration with several vocational teacher education institutions in the project, "Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education." The investigators believe that those who are interested in developing and testing feedback techniques for teacher education will find these reports helpful.

The investigators wish to thank the panel of judges who volunteered their time to evaluate the 84 videotaped teaching sessions. The panel members were Miss Joanne Wohlgenant, home economics teacher educator, Washington State University, and Mr. Warren Weiler, former state supervisor of vocational agriculture, State of Ohio. Great appreciation is extended to the following persons who volunteered their time to participate as teachers in the study:

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Calvin J. Cotrell
Charles R. Doty

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SUMMARY

The third in a series of three studies of selected micro-teaching and video recording feedback techniques in laboratory settings designed to simulate vocational teacher education programs, this study involved a comparison of the relative effectiveness of three feedback techniques: 1) face-to-face supervision with video feedback, 2) remote supervision via video feedback which included a second sound track with the teacher educator's comments, and 3) remote supervision via video feedback augmented by instructional models for self-comparison. Twelve vocational teachers, randomly assigned to the three feedback groups with four in a group, practiced demonstrating a manipulative skill during seven five-minute teaching sessions over a period of six weeks. Their video-recorded lessons were evaluated by a panel of two judges, using the critique form on demonstrating a manipulative skill.

For each of the three feedback groups, the mean performance scores derived from the panel's ratings were subjected to analysis of variance tests which revealed no significant differences in effectiveness among the three feedback techniques. Each feedback technique did, though, significantly affect change in teachers' performance over the seven teaching sessions.

Also reported were the attitudes and reactions of the participating teachers and the investigators.

As a result of the findings it was concluded that the three teacher education feedback techniques were feasible methods for programs of vocational teacher education, provided individual needs and facilities were taken into consideration.

ASSESSMENT OF MICRO-TEACHING AND VIDEO RECORDING IN VOCATIONAL AND TECHNICAL TEACHER EDUCATION: PHASE III--

AN ANALYSIS OF INSTRUCTIONAL MODEL AND REMOTE FEEDBACK TECHNIQUES

CHAPTER I

BACKGROUND OF THE STUDY

Current vocational and technical teacher education programs are not expanding rapidly enough to serve the needs of the increasing number of and the demand for well-prepared vocational teachers. According to Venn (1968), preservice programs are not producing an adequate supply of teachers. And, since the number of teachers in the field has been increasing so rapidly, inservice teacher education programs have been neglected (Barlow, 1966). It is essential, therefore, to search for potential solutions to this problem and to develop more effective and efficient programs of vocational teacher education. Reports from Stanford University and other institutions of successful applications of the concepts of micro-teaching and video recording with programs of general elementary and secondary teacher education encouraged the staff at The Center for Vocational and Technical Education to initiate a series of investigations into the application of these innovative techniques as potential methods for improving programs of vocational and technical teacher education.

THE FOUNDATION FOR A SERIES OF STUDIES

Vocational and technical teacher education programs with the resources to provide the laboratory for assessing the values of micro-teaching and video recording were not available in 1967, during the planning stages of this project. Therefore, the first three studies in the project were conducted in simulated teacher education programs at The Center for Vocational and Technical Education. Subsequently, the materials and techniques were screened, refined, and adapted for seven field tests and demonstrations.

It was the investigators' desire to develop and assess the feasibility of preservice and inservice teacher education techniques which would save teacher educators the loss of time traveling to schools and would increase the efficacy of typical vocational teacher education methods classes.

Because its inherent economy allows short teaching sessions and small numbers of students and permits a micro-skill of teaching to be practiced and developed rapidly, the micro-teaching format was regarded as ideal for testing the effects of various

teacher education techniques (Allen and Ryan, 1969). Hence, simulating practice teaching, an internship, or itinerant teacher education conditions was facilitated. Developing and refining the essential instruments, designing, and testing promising teacher education feedback techniques were some of the challenges for this study, which was the third in the series of three efforts required to prepare for field testing.

RELATED STUDIES

In designing this study, several investigations in general elementary and secondary education were carefully perused for applications and techniques which seemed appropriate for vocational and technical education. The most extensive of these were directed by Bush and Allen at Stanford University (1964). For simulation, the investigations by Kersh (1963) and Vlcek (1965) were found helpful. For the micro-teaching format and process, the reports of Olivero (1964) and Acheson (1964) were invaluable. The work of Allen and Young (1966) provided assistance in the use of the second sound track techniques. Information on modeling procedures was obtained from the work of McDonald and Allen (1966). In the development of measuring instruments, the work of Fortune (1965), Allen (1966), and Bush, *et al.* (1966) was studied.

PURPOSE AND OBJECTIVES

The central purpose of the study was to design and pretest the feasibility of selected teacher education feedback techniques, supporting evaluation instruments, and instructional materials under simulated vocational teacher education conditions. Specifically, the objectives of the study generated the following questions:

1. What are the comparative merits of the selected teacher education feedback techniques in terms of teacher performance: a) face-to-face supervision with video feedback, b) remote supervision via video feedback which includes a second sound track with the teacher educator's comments, and c) remote supervision via video feedback augmented by instructional models for self-comparison?

2. What are the participating teachers' attitudes toward the teacher education feedback techniques and materials being tested in the simulated inservice vocational teacher education program?

3. Are the three teacher education feedback techniques feasible for field testing or application in ongoing inservice vocational teacher education programs?

CHAPTER II

PROCEDURES IN THE STUDY

To obtain evidence to answer the questions central to the objectives of the study, a laboratory program was organized at The Center for Vocational and Technical Education to provide a vehicle for testing the experimental teacher education techniques under simulated conditions.

In the simulated inservice teacher education, three groups of vocational teachers, with each group experiencing a different teacher education feedback technique, engaged in seven teaching sessions during a six-week period. Each teaching session was a complete lesson, containing an introduction, presentation, application, and evaluation. Demonstrating a manipulative skill was the teaching technique practiced in the teaching sessions. The first session provided pretest data; the other six consisted of three sets of teaching and reteaching sessions in the micro-teaching format: 1) plan, 2) teach, 3) critique (feedback), 4) replan, 5) reteach, and 6) critique. All of the teaching sessions were video-recorded for the feedback and data collection procedures. Video recordings of the supervisory conferences (critique sessions) were also made for possible future study of supervisory skills and techniques. Thus, the program was designed to include micro-teaching for the practice of teaching skills and video recording for data collection.

SELECTION OF TEACHER EDUCATION TECHNIQUES

The first study in the series concentrated on the traditional teacher education technique of face-to-face supervision and on remote feedback techniques utilizing micro-teaching and video recording (See Glossary for definitions of terms). The second study included face-to-face supervision with and without video replay, delay in feedback, and remote audio feedback integrated with micro-teaching and video recording. These prior studies also included both preservice and inservice vocational and technical teachers, since the investigators wished to collect information on the attitudes and performances of the different categories of teachers on the various teacher education techniques.

In consideration of the problems and needs of vocational teacher education and the results of the two previous studies, the

following techniques and applications of micro-teaching and video recording were selected for this third phase of the project: 1) face-to-face supervision with video feedback, 2) remote supervision via video feedback which included a second sound track with the teacher educator's comments, and 3) remote supervision via video feedback augmented by instructional models for self-comparison.

1. Face-to-face supervision with video feedback. The five-minute teaching session was personally viewed by the teacher educator and was also video-recorded. Immediately following the lesson, the teacher, the students, and the teacher educator each evaluated the lesson, using the critique form on demonstrating a manipulative skill. The teacher educator collected the critique forms and quickly discussed the comments and evaluations. Then the students left the laboratory, and the teacher and the teacher educator viewed the videotaped replay of the teaching session. During the viewing, no comments were made. Following the viewing, the teacher and the teacher educator analyzed the teaching session with replay of the videotape where necessary. Then the teacher spent 15 minutes replanning the same lesson and taught it to a different group of students. This was followed by another critique session. (The entire procedure required one and one-half hours.)

2. Remote supervision via video feedback which included a second sound track with the teacher educator's comments. After the five-minute teaching session, which was video-recorded, the teacher and the students evaluated the lesson using the critique forms and then left the laboratory. The completed forms were collected by the technician operating the video recording equipment. The teacher educator, sometime during the seven-day period after the initial teaching session, viewed the video recording of the lesson, read over the teacher's and students' critique forms, and prepared notes for his comments. He then recorded his comments on the second sound track of the videotape containing the teaching session. This was done so that, on the replay of the lesson, the teacher would be cued to look for certain behaviors. As the video and audio recording of the teacher's lesson was being played, the teacher educator's comments could also be heard. Simultaneously then, the teacher could see his image, hear his own voice, and hear the teacher educator's comments. On the tape at the end of the recorded teaching session, the teacher educator's comments consisted of a summary of points and ideas for future implementation.

A week after the first teaching session, the teacher returned to the laboratory to view the videotaped replay of his teaching session. During a second replay, the teacher also heard the teacher educator's comments. Then the teacher spent 15 minutes replanning the lesson to teach it to a different group of students. This was followed by another critique session.

3. Remote supervision via video feedback augmented by instructional models for self-comparison. After the five-minute teaching session, which was video-recorded, the teacher and the students evaluated the lesson using the critique forms and then left the laboratory. The completed forms were collected by the technician operating the video recording equipment. The teacher educator, sometime during the seven-day period after the initial teaching session, viewed the video recording of the lesson, read over the teacher's and students' critique forms, and selected from the videotape library of recorded teaching sessions an instructional model for the teacher to view. This videotaped instructional model was transferred onto the tape containing the teaching session.

A week after the first teaching session, the teacher returned to the laboratory to view the videotaped replay of his teaching session. After also viewing the instructional model, the teacher took 15 minutes to replan the lesson and then taught it to a different group of students. This was followed by another critique session.

PARTICIPANTS

Teacher educators. The two teacher educators who participated in the study were graduate research associates at The Center who had a minimum of seven years' teaching and two years' supervisory experience.

Teachers. Twelve teachers representing the vocational service areas of agricultural education, business and office education, home economics, and trade and industrial education were selected from a population of volunteers who were teachers in nearby secondary schools. The teaching experience of these persons ranged from three months to 14 years in public and military teaching.

Students. Twenty high school students at the eleventh- and twelfth-grade levels, contacted through their high school guidance counselors, were employed for the study. The criteria for their selection specified that they be at either grade level and have a record of good conduct and citizenship. Before the students were employed, they were required to sign a legal waiver allowing The Center to use the video recordings for instructional purposes.

Panel of judges. An independent, two-member panel of judges was utilized to rate the teachers' performance by viewing the video recordings of all teaching sessions and completing the critique form. A teacher educator and a state supervisor for vocational education served as the judges in this study.

MEASUREMENT INSTRUMENTS

Helping teachers develop the technique of demonstrating a manipulative skill was selected as the educational objective for the inservice teacher education program.

To facilitate the teaching of the technique of demonstrating a manipulative skill, an instrument (the critique form) was developed which concentrated on that skill (See Appendix A). The instrument served as a guide for instruction and the evaluation of the teacher by the teacher educator and as a self-evaluation device for the teacher. In addition, the students used this instrument to analyze the teacher's performance. The form was also used by the teacher educator to determine how the teacher and the students evaluated the teaching and as a research tool for the panel of judges to measure teacher performance.

The participants received training and practiced using the critique form. The teachers, the teacher educators, and the panel of judges read and discussed a written description of the teaching skill and the instrument and then viewed a televised presentation explaining them. All users of the instrument, including the students, had a practice session in which they evaluated a videotaped teaching session using the critique form.

The panel of judges received additional training in using the form in that they viewed and evaluated a total of four video-recorded micro-teaching sessions. Their evaluations were compared to those previously done by the project staff. Once agreement was reached between the judge's ratings and the staff's ratings, the panel evaluated the 84 micro-teaching sessions in the study. In this study the critique form proved satisfactory and produced a reliability coefficient of .92 between the two panel members' mean ratings of the teaching sessions, based on Winer's one-way analysis of variance (1962).

After all the teaching sessions were completed, the teachers also responded to a follow-up questionnaire to determine their reactions to their experiences (See Appendix B).

EXPERIMENTAL DESIGN

The experimental design selected was a repeated measurement design calling for stratified random assignment of 12 subjects to three treatment groups with observation and measurement of all seven teaching sessions (See Figure 1).

The statistical design of the study was an analysis of variance based on a three-factor (treatment groups, teaching sessions, raters) experiment with repeated measurement on the last two

factors (Winer, 1962). The Biomedical computer program BMD02V was used with special application for the repeated measurements design (Dixon, 1967).

Treatment Group 1	SR	O_1	O_2	X_1	O_3	X_1	O_4	X_1	O_5	X_1	O_6	X_1	O_7
Treatment Group 2	SR	O_1	O_2	X_2	O_3	X_2	O_4	X_2	O_5	X_2	O_6	X_2	O_7
Treatment Group 3	SR	O_1	O_2	X_3	O_3	X_3	O_4	X_3	O_5	X_3	O_6	X_3	O_7

SR = stratified random sampling
O_1, O_2, etc. = teaching sessions
X_1, X_2, etc. = feedback techniques

Figure 1. Experimental Design

CONDUCT OF THE STUDY

To reduce the possibility of bias in the data collected and to insure that the teaching sessions ran smoothly and efficiently, the program was planned and conducted with consideration of certain factors.

Data collection began with the first teaching session, which served as the "pretest." This teaching session provided the teachers and other participants with the opportunity to become acquainted with their surroundings and the procedures to be followed. In addition, the teachers met the teacher educators and had an opportunity to view the videotape of the first teaching session in private to become acclimated to the idea of seeing themselves on the screen and to correct any distracting mannerisms in their teaching behaviors. Since the first teaching session also took place before the training session on the technique of demonstrating a manipulative skill, the pretest data provided the investigators with a measure of the teachers' ability before any treatment, practice, or instruction.

Before the teachers began their second teaching session, they received instruction on demonstrating a manipulative skill. Because of scheduling difficulties, this instruction was given at several different times in the form of a televised presentation along with a written description of the teaching skill which was read and discussed.

Several factors were also taken into consideration in establishing the procedures for the stratified random sampling. In assigning teachers to treatment groups, sampling was arranged so that each of the three treatment groups was composed of one teacher from each of the four vocational service areas. In assigning teachers to the two teacher educators, sampling was arranged so that each teacher educator supervised two teachers from each of the three treatment groups.

To reduce the possibility of bias, the panel of judges viewed the 84 videotaped teaching sessions (seven lessons by 12 teachers) in a random order so that in rating them the panel members were unaware of whether they were viewing a first or last teaching session.

All controlling measures and procedures were carefully outlined and explained to all participants. Teachers received a list of step-by-step directions, as did the technicians operating the video recording equipment. The teacher educators were supplied with two sets of instructions dealing with observation and paper handling details and supervisory guidelines.

EQUIPPING THE LABORATORY

Two video recording systems (one serving as a back-up in case of equipment difficulties), consisting of an Ampex Video 7500 Recorder, Ampex CC-324 camera, Cannon C-16 zoom lens, Sampson 7301 tripod, Zenith solid-state TV monitor, and a Norelco D109 lavaliere cord-type microphone with an Atlas M12 stand, were used in the laboratory. Lighting facilities included two 10-inch Color-Tran mini-lights with B5-32F 1000-watt quartz lights. The minimum essentials for setting up the micro-teaching classrooms were a chalkboard, music stand for notes, table, four student chairs, flip chart, overhead projector, and a large clock with five minutes outlined in boldface on it.

CHAPTER III

RESULTS OF THE STUDY

The results of the data collection and analysis of the study are presented in this chapter. Included are findings relative to the teachers' performance on the technique of demonstrating a manipulative skill while undergoing one of the three teacher education feedback techniques, the teachers' attitudes and opinions regarding their experiences and the investigators' informal observations, and the feasibility of the feedback techniques.

TEACHERS' PERFORMANCE

The data analyzed were collected from the panel of judges' ratings of the teachers' performance on the technique of demonstrating a manipulative skill. For all analyses, the mean scores of the two panel members' ratings were used (See Table 1). Mean scores on the accomplished scale had a range of 0-1 (did not accomplish = 0; accomplished = 1); the degree of accomplishment scale mean scores had a range of 0-5 (did not accomplish = 0, very poor = 1, poor = 2, average = 3, good = 4, excellent = 5).

TABLE I

Mean Scores by Treatment Groups
Panel of Judges' Ratings

TREATMENT GROUPS	SCALES	TEACHING SESSIONS 1	2	3	4	5	6	7
1	Accomplished	0.714	0.732	0.750	0.964	0.964	0.964	1.000
	Degree of Accomplishment	2.535	3.056	3.403	3.861	4.339	4.050	4.600
2	Accomplished	0.714	1.000	1.000	0.982	0.982	0.982	0.982
	Degree of Accomplishment	2.660	4.035	4.475	4.463	4.625	4.535	4.500

Continued

TABLE I Continued

3	Accomplished	0.750	1.000	1.000	1.000	1.000	1.000
	Degree of Accomplishment	2.821	3.946	4.460	4.678	4.888	4.586	4.851

The conditions were met for using analysis of variance, since there were no significant differences among the treatment groups on the first teaching session on either scale (See Table 2). Consequently this method was used to test the teachers' performance on teaching sessions 2, 3, 4, 5, 6, and 7.

TABLE 2

Analysis of Variance
Teaching Sessions 1 and 2--Panel of Judges' Ratings
(3 Treatment Groups With 4 Teachers Per Group)

Teaching Session	Scale	Source	S.S.	d.f.	F*
1	Accomplished	Treatment	.004	2	.01
		Error	2.137	9	
	Degree of Accomplishment	Treatment	.164	2	.02
		Error	32.342	9	
2	Accomplished	Treatment	.191	2	1.22
		Error	.719	9	
	Degree of Accomplishment	Treatment	2.344	2	.70
		Error	15.109	9	

*Significant at the .05 level if $\geq$ 4.26.

The teachers' performance was also tested on the second teaching session to determine if there were significant differences among the groups after receiving instruction on the technique of

demonstrating a manipulative skill. As can be seen in Table 2, no significant differences existed on either scale for the second teaching session.

Analyses made to assist the investigators in arriving at an answer to the first question posed in the study were concerned with testing for: 1) significant differences in teacher performance among the three teacher education techniques on both scales over the seven teaching sessions, 2) significant differences among the scores for teaching sessions two to seven for all teachers in the combined feedback groups, and 3) significant interactions among the treatment groups and the teaching sessions (i.e., Did a certain combination of teaching session and teacher education feedback technique result in a significant difference in performance?).

Differences among feedback techniques. The tests of analysis of variance computed revealed that no significant differences existed among the three teacher education feedback techniques in teacher performance over teaching sessions two to seven on the accomplished scale (See Table 3, Source A) or on the degree of accomplishment scale (See Table 4, Source A).

Figures 2 and 3 show the plotted mean performance scores of the three treatment groups for the accomplished and degree of accomplishment scales, respectively. Figure 2 indicates that the three treatment groups performed similarly on the first teaching session (pretest). After receiving instruction on the technique of demonstrating a manipulative skill and teaching for the second time, treatment group 1 (face-to-face supervision with video feedback) began to lag behind on the accomplished scale. This lag was not statistically significant (Table 2) for either scale, due to the low number of teachers (4) per treatment group and the range of the accomplished scale (0 to 1). By the seventh teaching session the three treatment groups had reached approximately the same level of performance. Figure 3 shows that on the degree of accomplishment scale the teachers in treatment group 1 also lagged behind the other two treatment groups until the last teaching session.

Differences among teaching sessions. The statistical tests showed that no significant differences occurred among the scores for teaching sessions two to seven on the accomplished scale (See Table 3, Source B). On the degree of accomplishment scale, significant differences were found, indicating that the combined scores of all teachers in the study differed significantly when compared from teaching session to teaching session (See Table 4, Source B). A comparison of the mean performance scores on the degree of accomplishment scale for the teachers in the combined feedback groups indicated that the greatest differences occurred between teaching sessions two and seven.

TABLE 3

Analysis of Variance
Teaching Sessions 2, 3, 4, 5, 6, 7--Accomplished Scale Mean Scores
(3 Treatment Groups With 4 Teachers Per Group)

Source	S.S.	d.f.	F*
A	.156	2	1.24
Error	.734	9	
B	.083	5	.94
A x B	.210	10	1.19
Error	.796	45	

*Significant at .05 level if $\geq$ 4.26 with 2, 9 d.f.; $\geq$ 2.06 with 5, 10 d.f.

TABLE 4

Analysis of Variance
Teaching Sessions 2, 3, 4, 5, 6, 7--Degree of Accomplishment Scale Mean Scores
(3 Treatment Groups With 4 Teachers Per Group)

Source	S.S.	d.f.	F*
A	6.325	2	.99
Error	28.855	9	
B	7.840	5	5.43*
A x B	2.042	10	.71
Error	13.007	45	

*Significant at .05 level if $\geq$ 4.26 with 2, 9 d.f.; $\geq$ 2.43 with 5, 10 d.f.

A = Treatment Groups
B = Teaching Sessions
A x B = Treatment Groups x Teaching Sessions (Interaction)

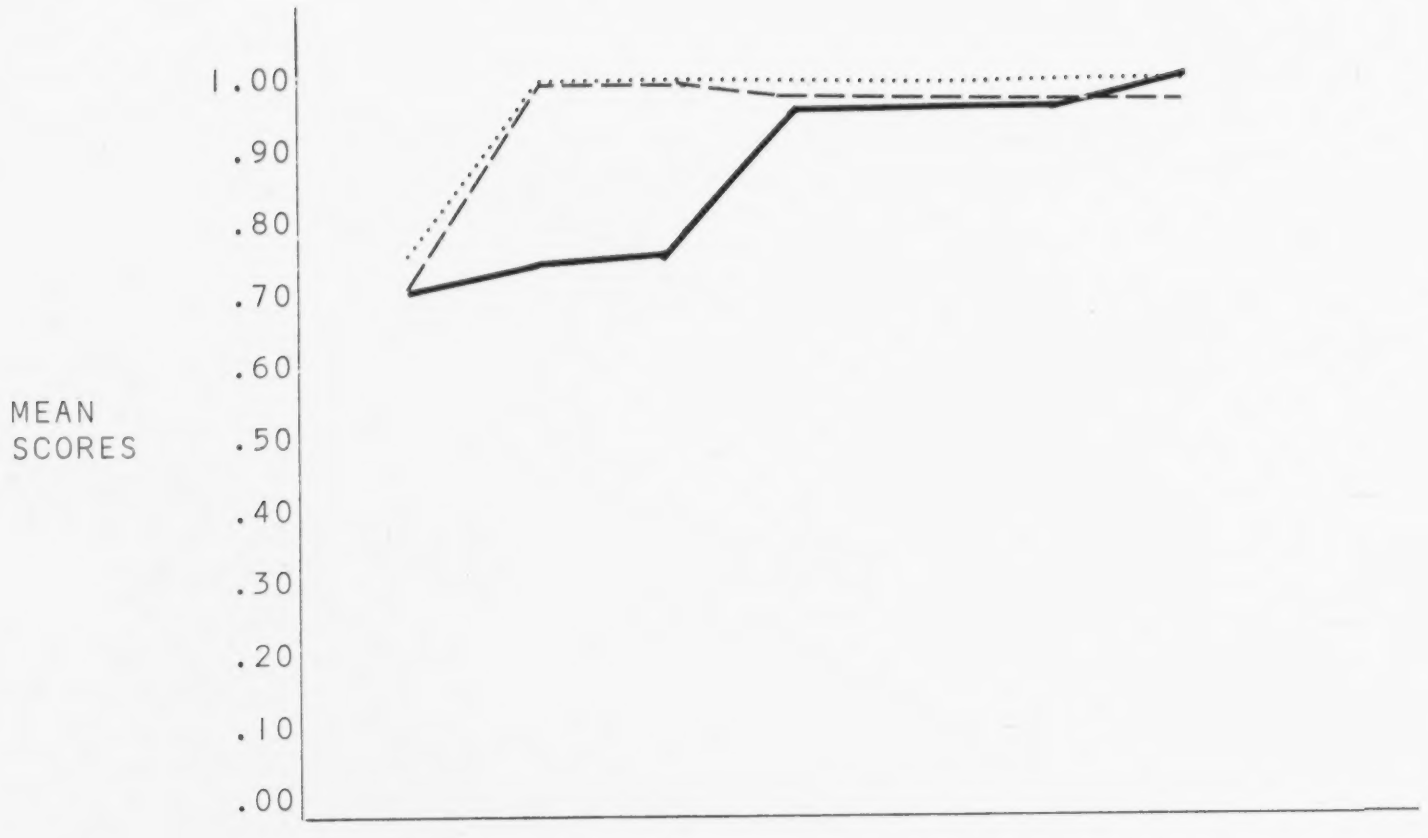

Figure 2. Performance Curves, Accomplished Scale Mean Scores (3 Treatment Groups)

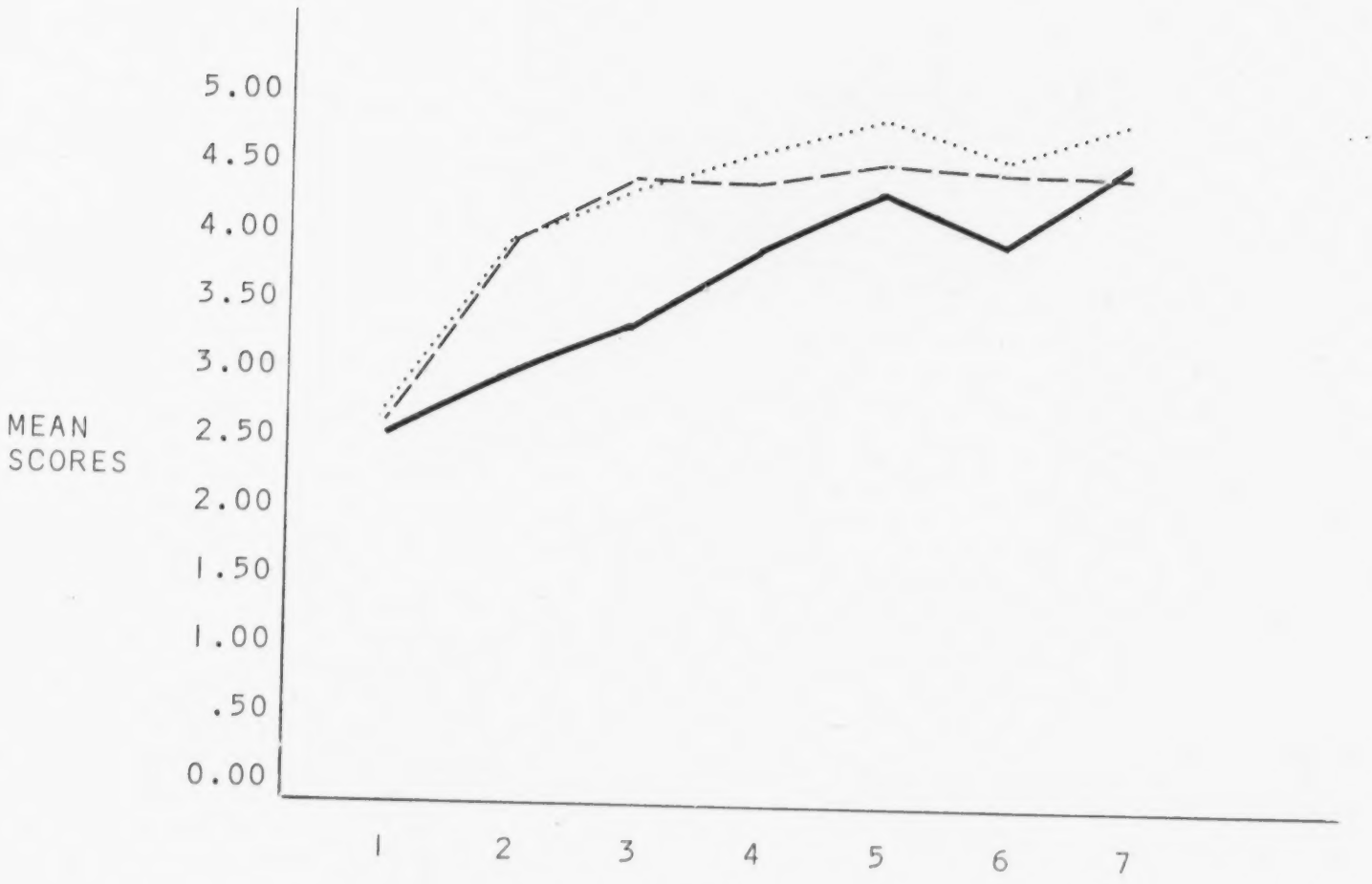

Figure 3. Performance Curves, Degree of Accomplishment Scale Mean Scores (3 Treatment Groups)

Interaction. Interaction among treatment groups and teaching sessions did not occur at a significant level on either scale, indicating that no combination of teaching session and teacher education feedback technique resulted in a significant difference in teacher performance (See Tables 3 and 4, Source A x B).

ATTITUDES AND OBSERVATIONS

Information was gathered for this portion of the study by means of the teacher questionnaire completed at the end of the seven teaching sessions and a poll of the investigators' and teacher educators' informal observations. Results of the teacher questionnaire are given in Table 5.

TABLE 5

Teacher Questionnaire Responses
(N=12)

Items	Ratings High 1	2	3	Low 4	No Response
1	6	6			
2	6	5	1		
3	5	2		4	1
5	6	6			
6	7	1			4
7	10	1			1

Teachers' attitudes and reactions. Of the eight items on the instrument, seven were applicable to the procedures and objectives of the study (Item 4 did not apply since the teachers had not received information about the students they taught). As indicated by the table, the six items (Item 8 was an open-ended question) all received mostly high or fairly high ratings from the teachers. Half the teachers felt that the orientation session gave them a very good idea of what was to be expected of them and the private viewing of the videotape of their first teaching session was a valuable experience. The third item on the

questionnaire referred to the value of teaching high school students instead of peers in the teaching sessions. Four participants indicated there was no difference and the others rated the item high or fairly high. All of the participants who responded rated the remaining three items (#5, 6, 7) on the high side of the scale. These items dealt with the quality of the instruction on demonstrating a manipulative skill, the value of the supervisory sessions, and the value of the total experience in the program, respectively. The four teachers who did not respond to the sixth item (on value of supervisory sessions) were the same four teachers who were in treatment group 3--remote supervision with video feedback and instructional models on videotape. Their comments reflected a wish to see a variety of instructional models and a need for information on how to use the models for self-evaluation and improvement.

Investigators' observations. The investigators' observations generally echoed the comments the teachers made, either on the questionnaire or verbally during the conduct of the study. A major issue and concern of the teachers who participated in the two treatment groups which did not include a face-to-face supervisory situation was the need to have some interaction with another person. The teachers in treatment group 2 (teacher educator comments on a second sound track) indicated they would have liked to meet with the teacher educator at least once during the program. The teachers receiving feedback by means of the instructional model videotapes (group 3) also wished to talk to someone about their teaching, indicating this need by trying to talk to the technicians. In addition to the need for instruction in using instructional models for self-evaluation, teachers also expressed a need for training in techniques of self-evaluation and practice in other teaching skills.

The use of micro-teaching techniques offered no problem to the participants, perhaps because some time was spent discussing the format and micro-lessons.

Video recording proved satisfactory for purposes of feedback and supervision though a problem was evident, since the use of the equipment in the recording of the teaching sessions did not allow for adequate judgments to be made regarding proper positioning of students to see the teacher's demonstration (Item 5 on the critique form). Time was also a factor in the use of video recordings. For treatment group 2, the teacher educators needed an hour to an hour and a half to view the videotapes, prepare their comments, and record their comments on the second sound track.

FEASIBILITY OF THE FEEDBACK TECHNIQUES

The question of the feasibility of the three teacher education feedback techniques for field testing or application in

inservice vocational teacher education programs was decided after consideration of the evidence obtained to answer the first two research questions (See page 4). In view of the similarities in teachers' performance and reactions to their experiences, as well as the investigators' informal observations, it was found that the feedback techniques were feasible under the simulated conditions established for the study. As indicated by Table 1, all groups showed an increase in mean scores over the seven teaching sessions, and significant differences were found between the combined scores for the groups on teaching sessions two and seven.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations for the study were drawn from the results of the statistical analyses of the data collected, the participants' attitudes, and observations made by the investigators.

CONCLUSIONS

Within the parameters of this investigation, the following conclusions have been formulated:

1. The three teacher education feedback techniques--face-to-face supervision with video feedback, remote supervision via video feedback which included a second sound track with the teacher educator's comments, and remote supervision via video feedback augmented by instructional models for self-comparison--each would have similar effects in changing teachers' performance in demonstrating a manipulative skill.

2. Inservice teachers involved in appropriately modified versions of these teacher education feedback techniques would be expected to react favorably to their experiences.

3. With certain modifications, the three teacher education feedback techniques should be feasible for inservice vocational and technical teacher education.

RECOMMENDATIONS

The following recommendations were made to guide future studies in the series:

1. In addition to an initial orientation conference, remote feedback techniques in inservice programs of teacher education should provide some other forms of personal contact between the teacher educator and the teacher. These may include planning for intermittent face-to-face conferences, telephone conversations, and/or audio recordings of the teacher's questions and comments.

2. Consideration should be given to the time element in planning and selecting feedback techniques. Although the remote techniques reduce travel time and costs, a good deal of time is needed to view and analyze the video-recorded teaching sessions.

3. In addition to using only one sound track of the videotape in the remote supervision technique, it was recommended that videotaping of the teacher educator during his critique might help improve communication with the teacher. It was noted that both recommendations may be accommodated by allowing videotape time before and after the part of the tape used in recording the teaching session.

4. Before undertaking the remote feedback technique using instructional models on videotape, it would be essential to build an adequate library of suitable tapes covering a wide variety of teaching skills and behaviors.

5. When the micro-teaching format is applied, teachers should be provided training in the selection of appropriate topics for short teaching sessions to avoid problems of teacher frustration and insure emphasis on practicing particular teaching skills.

6. With the above modifications incorporated, the three teacher education techniques investigated in this study should be field tested in ongoing vocational and technical teacher education programs.

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GLOSSARY OF TERMS

Complete lesson. An act of teaching, incorporating the four steps of instruction: introduction, presentation, application, and evaluation.

Instructional model. A video recording of a complete or partial teaching session which illustrates a teaching skill, e.g., introducing a lesson.

Laboratory conditions. An environment designed to simulate a vocational and technical teacher education program, e.g., a teacher teaching in his own classroom or laboratory, being observed by a teacher educator, and receiving feedback.

Micro-teaching. A scaled down teaching session, five to 10 minutes of teaching to four or five students, in which the teacher participates in the full sequence of the micro-teaching cycle: plan, teach, critique (feedback), replan, reteach, critique.

Pretest. The first teaching session in this study. This teaching session was used to allow the teachers to become acquainted with the physical facilities and procedures. Also, this session was used to determine the teachers' capabilities prior to involvement in the study.

Remote feedback. A technique whereby the teacher receives supervision via video playback of his teaching session and audio playback of the teacher educator's comments. There was no personal contact between the teacher and teacher educator. The teacher listened to the recorded comments on the audio tape after viewing a video playback of his teaching session.

Video feedback. The procedure used in the study which involved preparing videotape recordings of all participants' teaching sessions to provide opportunities for the teacher educator and teachers to view a replay of the teaching session.

APPENDICES

APPENDIX A

CRITIQUE FORM

DEMONSTRATING A MANIPULATIVE SKILL

In helping you to learn an occupation, your teachers will be presenting new manipulative skills to you through a method of teaching known as the demonstration. If the teacher has given a good demonstration and you have been a good observer and listener, you should be ready to attempt to perform the manipulative skill safely and step by step.

The following items will be used by you to evaluate your teacher's teaching. If the teacher did not accomplish the item, you will only mark "Did Not Accomplish." If the teacher did accomplish the item, you will mark "Accomplished" and then mark the column which describes how well the teacher "accomplished" the item.

Did the Teacher in the Demonstration:

	DID NOT ACCOMPLISH	ACCOMPLISHED	DEGREE OF ACCOMPL.				
			VERY POOR	POOR	AVERAGE	GOOD	EXCELLENT
1. Have all equipment, tools and materials ready for use?							
2. Talk to you and not to the tools or materials? (Note: In some demonstrations; for example, one where the teacher has a machine running, he must keep his attention on the machine, but he also can make you feel he is directing his attention to you.)							
3. Present each step of the procedure, task, skill, or operation in the proper sequence?							
4. Briefly state what step is to be performed, how and why it is performed, then perform it?							
5. Position himself or you so that each step was easily seen, using visual aids to make clear any step that could not be clearly demonstrated?							
6. Present only one method of doing the operation giving only key points of information necessary to complete the task safely and efficiently? (Or did the instructor present two or more methods of giving additional information (stories) which confused you.)							

	DID NOT ACCOMPLISH	ACCOMPLISHED		DEGREE OF ACCOMPL.				
				VERY POOR	POOR	AVERAGE	GOOD	EXCELLENT

7. Perform the manipulative skill with ease?

Comments: (What can the teacher do to improve the use of questions in the lesson?)

Teacher _____ Date _____

Observer _____

APPENDIX B

TEACHER QUESTIONNAIRE

Name _____ (Name not necessary)

Treatment _____

Please comment on each item.

1. As a result of the first orientation to micro-teaching and videotape recording, did you understand what it was you were expected to do as a prospective participant?

☐Very Well ☐Fairly Well ☐Uncertain ☐Not at all

What are your suggestions for future orientation? _____

_____

2. Do you think the teaching and viewing of your first lesson without previous explanation from us on how to teach was a valuable experience?

☐Of great value ☐Of some value ☐Of minimal value ☐Of no value

What did you learn from the first lesson? _____

_____

3. Do you feel that teaching students from the level you are planning to teach is of greater value than the teaching of peers in methods classes?

☐Of great value ☐Of some value ☐Of minimal value ☐No difference

Why? _____

4. Do you feel that the background information on the students and the get-acquainted period was of benefit for your teaching encounter?

☐Of great value ☐Of some value ☐Of minimal value ☐Of no value

What else could be done? _____

5. Do you feel that the skill presentation on _____ was adequate in explaining this teaching skill?

☐ Very adequate ☐ Fairly adequate ☐ Adequate ☐ Inadequate

How could we improve? _____

_____

6. Were the supervisory sessions of value in helping you replan the lesson to better attain the teaching skill?

☐ Of great value ☐ Of some value ☐ Of minimal value ☐ Of no value

How could the supervisor improve technique? _____

_____

7. As a part of your total preparation for teaching, was this teaching experience of value?

☐ Of great value ☐ Of some value ☐ Of minimal value ☐ Of no value

In what way? _____

8. Please give any other suggestions that you have for our planning future teaching sessions.